

REMARKS

Favorable reconsideration is respectfully requested.

The claims are 12 to 25.

The above amendment is responsive to points set forth in the Official Action.

In this regard, claims 12 to 24 are placed in “consisting essentially of” rather than “comprising” format.

Further, claims 20 to 24 are amended for clarity and new claim 25, which corresponds to previous claim 18, is presented.

The significance of these amendments will become further apparent from the remarks below.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the publication Derwent Acc No. 1981-54812D in view of Schwer (U.S. 4,447,265).

This rejection is respectfully traversed.

Derwent relates to the production of a lime-based flux whereby calcium nitrate is added to freshly calcined lime as it cools whereby the nitrate melts and saturates the surface of the lime lumps.

This flux is added to a steel making slag whereby O₂ and N₂ gases help to mix the slag.

The mere fact that Derwent discloses the use of small amounts of calcium nitrate to stir the melt is not a suggestion of foaming. No mention is made in Derwent of actually foaming the slag.

In any event, the CaO essential to Derwent, is excluded from the present claims due to their “consisting essentially of” format. This excludes from the present claims materials such as CaO being added to the slag since the addition of such would materially alter the present invention from the standpoint of operability and patentability.

With regard to Schwer, it mentions adding a source of an oxide of calcium to foam steel making slag and the rejection contends that calcium nitrate could fall within this meaning. According to Schwer, however, the source of an oxide of calcium, which may be used, includes standard lime, dolomitic lime and mixtures thereof, as well as other calcium oxide sources

known in the steelmaking art. It does not appear obvious from Schwer to employ calcium nitrate of Derwent as the source of calcium oxide for foaming, since Schwer prefers to use the oxide in calcined form and does not even mention calcium nitrate.

To combine Schwer with Derwent is at best an improper hindsight reconstruction of the present invention and the combination would not even lead to the invention as presently claimed, especially in view of the “consisting essentially of” terminology of the present claims.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Derwent Acc No. 1981-54812D in view of Schwer (U.S. 4,447,265) as applied to claim 12 above, and further in view of Masucci (U.S. 5,395,420).

This rejection is also respectfully traversed.

Claim 18 relates the foaming of stainless steel slags. Neither the Derwent reference, nor Schwer refer to the foaming of stainless steel slags which are difficult to foam as disclosed on page 2, line 16 et seq. of the present specification. Masucci, however, describes a process for using foamed slag in stainless steel production. This process is based on foaming owing to the carbon dioxide produced by the following reactions; 1) combustion of the carbon dissolved in the bath, 2) between the carbon added as carbon and/or coke and the chromite in the slag, and 3) between limestone and carbon in the slag.

There is no reference to foaming caused by other gases and there is no hint to use additives other than calcium oxide.

None of the references, alone or combined, describe the advantageous use of calcium nitrate to foam stainless steel slags.

Claim 18 not only specifies that calcium nitrate alone or together with carbon should be added as foaming agent but also that FeSi, Al or Mg be added before the other components. This is crucial to prevent oxidation of Cr and to reduce the Cr₂O₃ content in the slag.

The present method of foaming stainless steel slag is thus both novel and unobvious.

Further, new claim 25 retains “comprising” terminology and is thus identical to previous claim 18.

However, even previous claim 18 is unobvious since there is no teaching in the prior art to add FeSi, Al or Mg before the other components to prevent the oxidation of Cr and reduce the Cr₂O₃ to the slag.

Claims 13 to 17 and 19 to 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Derwent Acc No. 1981-54812D in view of Schwer (U.S. 4,447,265) as applied to claim 12 above, or further in view of Masucci (U.S. 5,395,420) as applied to claim 18 above, and further in view of Rossborough (U.S. 5,358,550).

This rejection is also respectfully traversed.

With regard to claims 13 to 17 and 19, the rejection states that it is known from Rossborough to inject an agent such as calcium nitrate. This is true, but only for desulphurization of the melt and not for foaming and it is not injected together with carbon either separately or as fused granules. The Derwent reference does not mention that either.

The rejection also refers to the fact that calcium nitrate may be used as a foaming agent to form foamed glass (Derwent Acc No: 1985-157654) but this has no relevance, as glass and steel are two completely different technical fields and the art skilled would not look to a reference dealing with glass melts to solve a problem with stainless steel melts.

With regard to the comment on page 3, lines 14 to 16 of the Official Action, the terminology in claims 20 to 24 has been clarified, as discussed above.

In view of the foregoing, the rejections on prior art are untenable.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

Petter TUVNES et al.

THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975

By: Matthew M. Jacob
Matthew M. Jacob
Registration No. 25,154
Attorney for Applicants

MJ/kes
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
March 3, 2005